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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/777,258

02/12/2004

David A. Torrey

AEC-0003

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EXAMINER

STERRETT, JEFFREY L

ART UNIT

PAPER NUMBER

2838

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

01/19/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

Application No.

10/777,258

Applicant(s)

TORREY ET AL.

Examiner

Jeffrey L. Sterrett

Art Unit

2838

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 11/28/06.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-16 and 18-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4-16, and 18-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Claims 1, 12, 15, and 20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Nakano (US 5,134,307) in combination with Gold et al (US 5,625,548).

Nakano discloses an inverter system comprising an AC network (T3 and T4); a DC source (12); a DC/DC converter (15, 45, and 70) coupled to the DC source synthesizing a time varying current (either the current through the isolation 45 or the DC from bridge rectifier 70 that has a ripple/harmonic components that requires filtering by LC filter LDC1/C4) from the DC source and comprising a full bridge MOSFET inverter (Q1-Q4 with inherent parasitic diodes shown and inherent parasitic capacitors not shown), an isolation circuit (45), and a rectifier (70); an output smoothing inductor (LDC1) coupled to the output of the DC/DC converter; and a full bridge inverter (77) coupled between the output inductor and the AC utility comprising switches (S1-S4) as recited by claims 1, 12, 15, and 20 except for specifying that the AC output of inverter 77 is connected to and in phase with an AC utility. Gold et al discloses as an old and known expedient in the art at the time of the invention that when the output of an inverter is connected to an AC utility it is very desirable, if not required, that the inverter be in phase with the utility (for example see lines 26-29 of column 4 and lines 9-12 of column 5). It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the inverter system of Nakano by phase synchronizing the AC output of the inverter 77 with an AC utility when the AC utility is the intended load of the inverter in order to properly add power to the utility as taught by Gold et al.

3. Claims 1, 2, 4-16, and 18-21 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Welches (US 6,404,655) in combination with Zhang et al (US 6,466,458).

Welches discloses an inverter system comprising an AC utility (60); a DC source (15); a DC/DC converter (30) coupled to the DC source synthesizing a time varying current (either the current through the transformer 25 or the DC from bridge rectifier 20 that has a ripple/harmonic components that requires filtering by LC filter L1/L2/C3/C4) from the DC source and comprising a full bridge MOSFET inverter (MOS1-MOS4 with inherent parasitic diodes and capacitors), an isolation transformer (25 with inherent parasitic inductances), and a rectifier (20); an output smoothing inductor (L1 and/or L2) coupled to the output of the DC/DC converter; and a full bridge inverter (40) coupled between the output inductor and the AC utility comprising switches (Q1-Q6) as recited by claims 1, 2, 4-16, and 18-21 except for utilizing a phase shifted bridge inverter as inverter (MOS1-MOS4). Zhang et al teaches phase shifted bridge inverters (figure 3) were an old and known expedient in the art at the time of the invention. It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the inverter system of Welches by utilizing a phase shifted bridge inverter as inverter (MOS1-MOS4) in order to obtain zero voltage switching as taught by Zhang et al.

4. Applicant's arguments filed November 28, 2006 with respect to the rejection of claims 1, 12, 15, and 20 under 35 U.S.C. § 102(b) as being unpatentable over Nakano (US 5,134,307) have been considered but are moot in view of the new ground of rejection.

5. Applicant's arguments filed November 28, 2006 with respect to the rejection of claims 1, 2, 4-16, and 18-21 under 35 U.S.C. § 103(a) as being unpatentable over Welches (US 6,404,655) in combination with Zhang et al (US 6,466,458) have been fully considered but they are not persuasive.

In response to the remarks that Zhang et al , and thus the combination of Welches and Zhang et al , fails to disclose providing a time varying current at the output of the DC/DC converter, it is noted that this limitation is only found in the invention as disclosed by applicants specification and not in the invention as recited by applicants claims. Independent claims 1 and 15 merely recited that a time varying current is synthesized from the DC not that the time varying current is output from the DC/DC converter. Zhang et al discloses an inverter system comprising a DC/DC converter (figure 3) synthesizing a time varying current (the current through the transformer Tr or the DC from bridge rectifier D1/D2 that has a ripple/harmonic components that requires filtering by LC filter L1/C2) from a DC source (C1) and likewise, as noted above, Welches discloses an inverter system comprising a DC/DC converter (30) synthesizing a time varying current (either the current through the transformer 25 or the DC from bridge rectifier 20 that has a ripple/harmonic components that requires filtering by LC filter L1/L2/C3/C4) from a DC source (15). Thus both Zhang et al and the combination of Welches and Zhang et al teach a time varying current synthesized from DC as broadly recited by the current claims.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey L. Sterrett whose telephone number is (571)

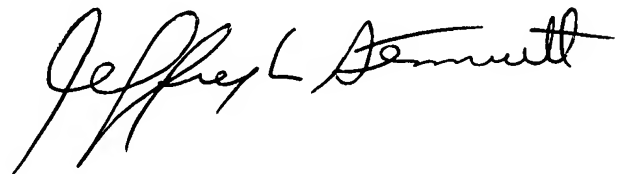
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272-2085. The examiner can normally be reached on Monday-Thursday & 7:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Karl D. Easthom can be reached on (571) 272-1989. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jeffrey L. Sterrett  
Primary Examiner  
Art Unit 2838

A handwritten signature in black ink, appearing to read "Jeffrey L. Sterrett", with a stylized flourish at the end.